

MATTER

4. Matter: anything that takes up space & has mass

- 1. Pure substance:** substance that contains ONE kind of particle
 - A) The smallest unit of matter that retains specific chemical and physical properties**
 - B) Element:** single substance that cannot be broken down

																		<div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 2px;">Metals</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 2px; margin-left: 10px;">Metalloids</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 2px; margin-left: 10px;">Nonmetals</div>											
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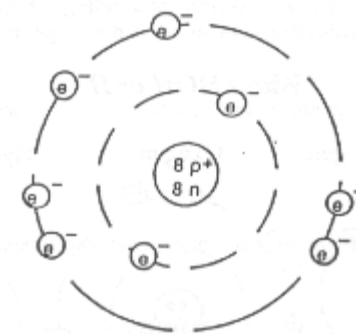
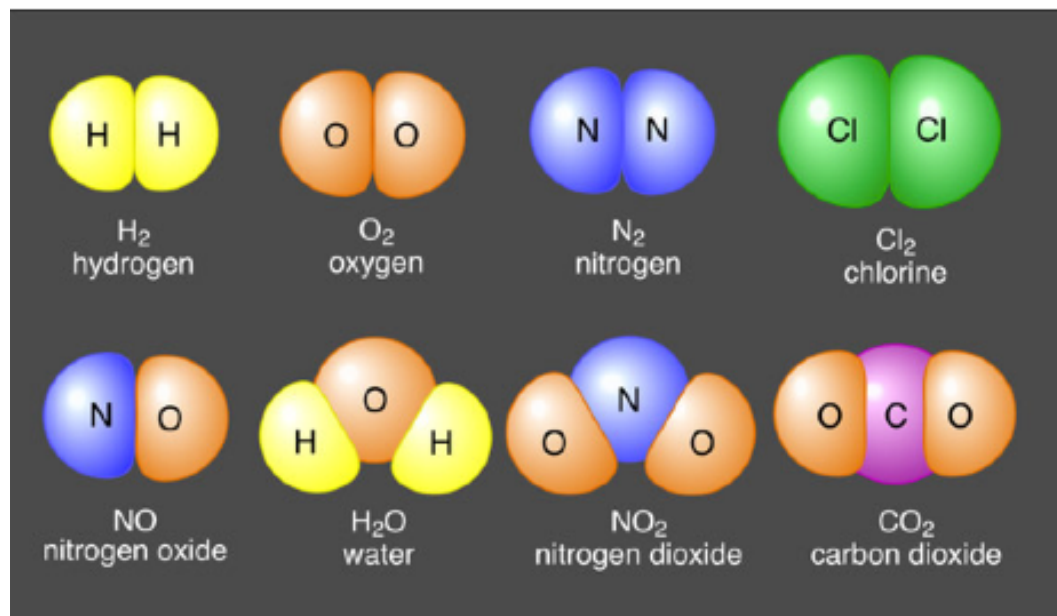


Figure 5. Oxygen atom

C) Molecule: two or more atoms joined together – not easily broken down

D) Compound: two or more different types of atoms joined together that can not be easily broken down



The Nature of Matter

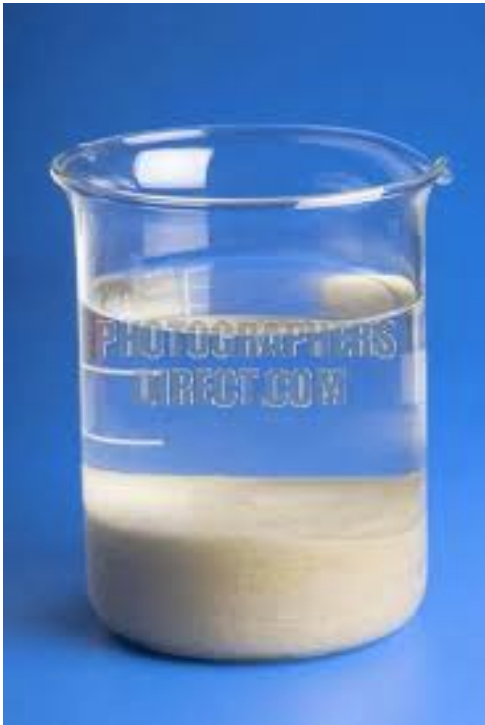
2. **Mixture:** Combination of substances that can be easily broken down



The Nature of Matter

2.A Heterogeneous: items can be easily identified

1. Suspension: mixture in which particles can be seen and easily separated by settling or filtration



The Nature of Matter

- 2. Colloid – A mixture containing particles larger than the solute but small enough to remain suspended in the solution – example homogenized milk**
Cannot be separated through filtration



The Tyndall Effect is the scattering of a light beam as it passes through a colloid.

An Emulsion is a colloid a mixture in which one liquid suspended in another – oil and vinegar is an example of an unstable emulsion because it quickly reverts back to two separate layers.

The Nature of Matter

2.B Homogeneous: items are uniform

1. Solution: Made up of the particles that are dissolved called **solutes** and the particles that do the dissolving called **solvents**



The Nature of Matter

A composite is a solid heterogeneous mixture of two or more substances not chemically bound that make use of the properties of each compound

EX: Composite decking



3) Physical properties – can be measured without changing the molecules of a substance – physical change would be going from one state of matter to another... solid to liquid, liquid to gas etc

Examples of physical properties:

1. Texture: Surface characteristic – rough or smooth
2. Uniformity – how consistent the material is throughout
3. Strength – how well material withstands force
4. Malleability: The ability to be beaten into thin sheets.
5. Ductility: The ability to be drawn into wires.
6. Conductivity: Allows the flow of free electrons. Electricity can move through the material.
7. Elasticity- ability of a material to resist deformation and return to normal size or shape
8. Bounce – ability of an object to rebound to original position
9. Melting point – temperature when substance goes from solid to liquid
10. Boiling point – temperature when substance goes from liquid to gas

What are properties of.....

Metals = yellow shaded elements

Metals:

- Ductile
- Good conductors of electricity
- Malleable
- oxidized by non-metals
- Reactive

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Metalloids

Metalloids:

- Share properties of both metals and non-metals
- Semi-conductors

Purple = metalloids

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Non-metals

Non-metals

- Poor conductors of electricity
- Dull
- Not very reactive
- Cause metals to oxidize
- Brittle (not ductile or malleable)

Non-metals = green

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Alloys

Have metal characteristics

Are composed of 2+ elements
not chemically combined

- EXAMPLES

- Steel

- Brass

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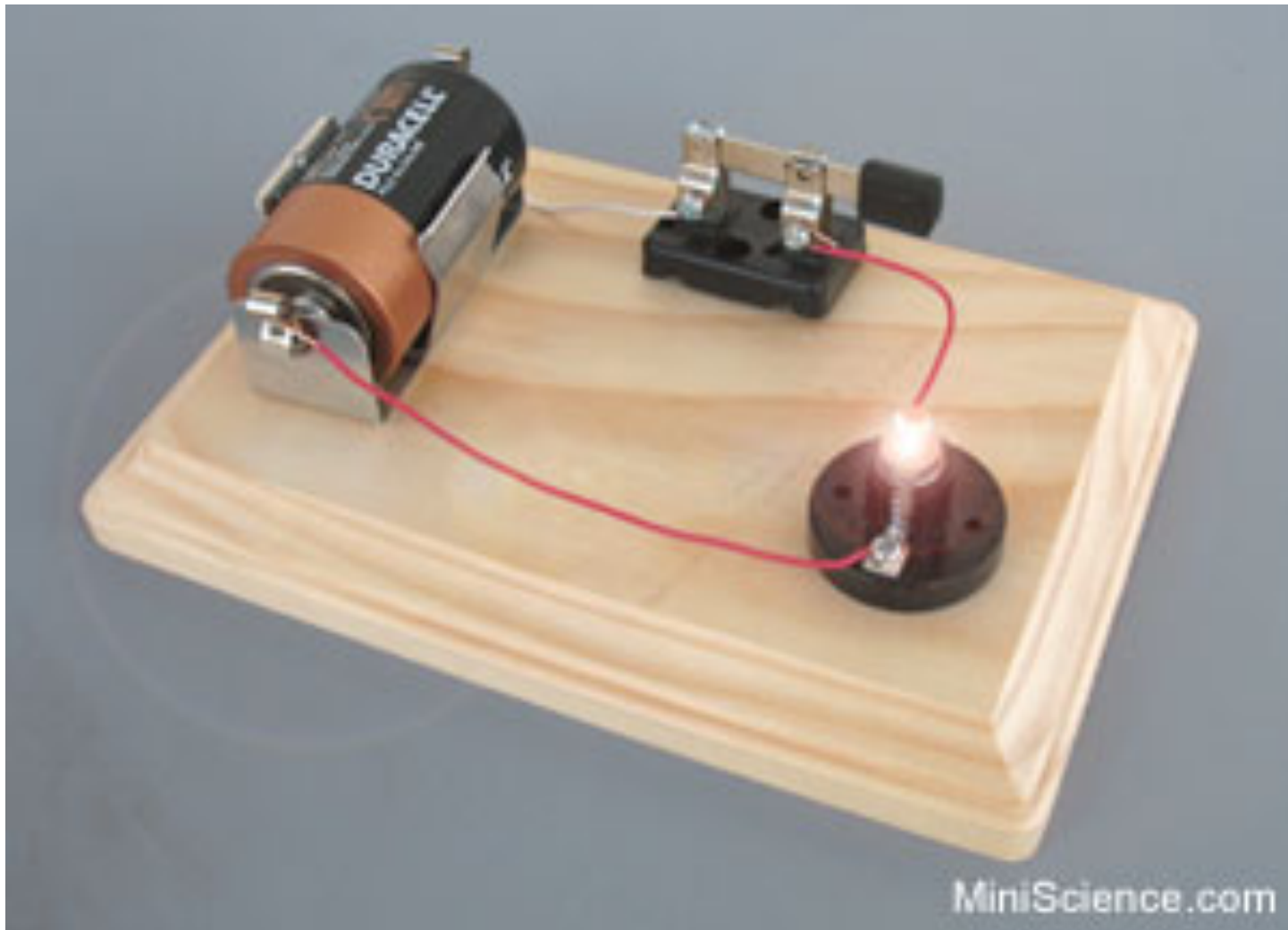
Metals are shiny & lustrous



Non metals are dull and brittle



**Metals are good conductors of electricity.....
That's why we use them for the wiring in our homes!**



Ductile

Ability of a metal to be stretched without breaking... typically dealing with metals being spun into wire



I always think of a duck spinning (:

Spinning wire that is!



Malleable

Metals ability to be pressed or hammered into sheets without break or fracture



**I usually think of a mallet –
pounding something &
flattening it**



Viscosity

A property related to the resistance of a fluid to flow!



High



Low

4) CHEMICAL CHANGE: IS ANY CHANGE THAT RESULTS IN THE FORMATION OF NEW CHEMICAL SUBSTANCES. AT THE MOLECULAR LEVEL, CHEMICAL CHANGE INVOLVES MAKING OR BREAKING OF BONDS BETWEEN ATOMS. THESE CHANGES ARE CHEMICAL: IRON RUSTING (IRON OXIDE FORMS)

Signs that a chemical reactions has taken place:

Production of LIGHT, HEAT, ODOR, SOUND, GAS, SOLID (precipitate)

Oxidation

The process of a substance losing one or more electrons... Metals react with oxygen and they RUST!

Metals are oxidized, non-metals are oxidizers



Reactivity

A property that describes how readily a material will react with other materials. Metals tend to be reactive!

